REMARKS

Claims 1 – 40 are pending in the application, claims 37 – 40 having been newly added by this Amendment.

This Amendment is in response to the Office Action dated October 10, 2007. In view of the amendments presented above and the detailed comments presented below, favorable reconsideration of the application is respectfully solicited.

In the Office Action, the Examiner re-drew the Restriction requirement, and objected to claim 15 under 35 U.S.C. §132(a) as introducing new matter into the disclosure by way of applicant's amendment of 10/19/2006. The Examiner also objected to the drawings under 37 CFR §§ 1.81 and 1.83(a). Claim 15 was rejected under 35 U.S.C. §112 as failing to comply with the written description requirement, and the Examiner rejected claims 4, 15, 24, and 35 under 35 U.S.C. §102(e) as anticipated by Richardson (U.S. PGPUB 2003/0156605). Each of these objections/rejections will be addressed in detail below.

THE RESTRICTION REQUIREMENT

The Examiner has reconsidered the Restriction requirement and has withdrawn claims 2, 3, 7 – 9, 12 – 14, 16, 33 and 36 from further examination. This action is in error. The reason given by the Examiner for the withdrawal of these claims is that the application discloses the use of an isolator only in conjunction with the embodiment of Fig. 1 employing the non-linear amplifier (which is currently non-elected). This is incorrect. Fig. 11 of the application, the elected "linear amplifier embodiment," shows the same "FI/Attn" element as in Fig. 1, the "non-linear amplifier" embodiment. As other figures such as Fig. 2 and Fig. 5(b) make clear, this unit

contains an isolator. Further, the specification clearly indicates that the Fig. 11 embodiment can include an attenuator, which of course includes an isolator as the specification and drawings (e.g., Fig. 5(b)) make plain. Therefore, the Examiner's reason given for the further withdrawal of the noted claims is in error, and these claims should be further examined on their merits.

An additional note is in order concerning claim 16, which is the main claim directed to the elected "linear" embodiment. Obviously the inclusion of this claim in the newly withdrawn group is clear error. Other claims which did not include the isolator were also withdrawn, including claim 33. This was also clear error.

Claim 2 has been amended to remove the "isolator" element in order to broaden the claim, and to guarantee the further examination of this claim and its dependencies.

Owing to the erroneous withdrawal of the listed claims, including the main claim directed to the elected embodiment, Applicants have not received a proper action on the merits of these claims. For this reason, *a new Office Action is required*, and must address these claims.

CLAIM REJECTIONS UNDER 35 U.S.C. §132 AND/OR 112, PARAGRAPH 1

A. *The Examiner's Position Regarding "New Matter"and lack of written description as to Claim 15*

The Examiner rejected claim 15 as failing to comply with the written description requirement and/or as introducing new matter.

Specifically the Examiner states that:

1. The original specification does not explicitly exclude the compressor module from being coupled to the system by a fiber splice

2. The original specification does not disclose up to n-1 means for connecting test equipment located between respective ones of the n modules, and
3. The original specification does not disclose up to n-1 means for improving fidelity of the polarization state between any of the n modules.

Applicants respectfully disagree with the Examiner's position, although it is correct to state that there existed phrasings in the claims, such as the "n – 1" limitation, which were not *in haec verba* present in the specification. A fair review of the specification and drawings as filed, however, does reveal that there was *support* for these limitations, although the support was not present in literal form.

The concept that Applicants wish to convey in claim 15, and in other claims such as claims 4 and 39, is that the various components are present or are provided in component form, and, as such, there must be provided a means of easily "plugging" the components into the system, and similarly, removing components which need to be replaced. In the invention, this means takes the form of a simple fiber splice, which is arguably the easiest and most direct way of "plugging in" optical components, as one need not be concerned, on the whole, with tedious and difficult free-space alignment of the various elements of the system, for example. Both the specification and the drawings clearly provide support for this concept, and thus the issue becomes one of how to present the concept in the claim language.

Applicants have chosen to reformulate the claims to a degree, specifically in order to recite that "at least" various named components are coupled into the system by fiber splices. The limitation as written now has literal support in the written description (which includes the

drawings, see MPEP 2163), and thus withdrawal of the rejections based on "new matter" or lack of written description is in order.

A similar solution has been presented for the claimed "tap units" (more generally claimed as a "means for connecting test equipment" in claim 15) and the polarization fidelity improving elements. It is now claimed that there is at least one of each of these elements in the system, located between components, but that their numbers are less than the number of the components themselves. Again, these limitations as now presented are clearly supported by the specification and the drawings as originally filed. (Specification, page 7, lines 4 – 5, and page 19, lines 4 – 9).

OBJECTIONS TO THE DRAWINGS

The Examiner objected to the drawings under 37 C.F.R. §§ 1.81 and 1.83(a). The Examiner states that all claimed features must be illustrated in the drawings, but gives no example of any claimed feature or features which are not so shown. Accordingly, Applicants have not been put on proper notice of any deficiency, and for this reason are not in a position to respond further at this time. To the extent that the drawing objection was linked to the rejection under 35 U.S.C. § 112 and objection under 35 U.S.C. §132 and the claim elements there discussed, amendments to the claims have addressed these issues. For both of these reasons, no amendments are presently made to the drawings and it is believed that none are in fact needed.

CLAIM REJECTIONS UNDER 35 U.S.C. §102

The Examiner rejected claims 4, 15, 25, and 35 over Richardson (U.S. PGPUB 2003/0156605).

A. The Examiner's Claim Language Interpretations

The Examiner has provided a lengthy section explaining the manner in which he has interpreted various words and phrases in the claims. This section is illuminating, in that it reveals that, in the Examiner's lexicon, "pre-tested" means "choosing the element", a "tap unit" is a "leaky fiber" and "selected" surprisingly can mean "not selected". This section also reveals that the Examiner regards several of Applicant's limitations as statements of intended use only.

The claims have variously been amended, in part for clarity of expression.

Applicants submit that the claims recite structures which are neither disclosed nor suggested by Richardson. The differences between the claims and Richardson are expanded upon below, in brief:

Claim 2: This claim is directed to replaceable modules, which are neither disclosed nor suggested in Richardson. Richardson says nothing concerning modularity and contains no indicia of modularity such as the functional segmentation, integration or componentization evidenced in the present application. Another aspect not evidenced by Richardson is the spectral filtering for oscillator/amplifier matching present in claim 2. Accordingly, Richardson is not anticipatory of claim 2.

Claim 3: Richardson neither discloses nor suggests an isolator means for isolating the oscillator from a first of said amplifier stages to a level of at least 35dB. Richardson does employ isolators at other stages of the system for different purposes, which are not suggestive of the arrangement claimed. Therefore, anticipation has not been established.

Claim 4: Similarly to claim 2, and building upon the former claim, claim 4 requires "*pre-tested modules*". The Examiner characterizes this limitation as "intended use/outcome"

functional language. Applicant disagrees with the characterization. "*Pre-tested*" describes a property or state of being of the integrated module. Richardson discloses neither the use of modules nor the pre-testing of the same.

Richardson further fails to disclose a system wherein at least the signal source, stretcher, fiber amplifier and AOM are individually coupled into the system via simple fiber splices. This feature is simply not suggested by the reference.

Still further, Richardson contains no disclosure of at least one tap unit within or between ones of said modules, including means for picking off a portion of the signal, to enable measurement of a spectrum within or between said modules, where there is at least one spectral filter narrowing the spectrum of the signal source, and at least one of said tap units is located downstream of this filter. Even if one discounts the purpose of the tap unit as being an expression of intended use, it is evident that "inherent leakage" cannot satisfy this limitation. "inherent leakage" does not constitute a tap unit. Further, there is no "means for picking off" a signal in the "inherent leakage" scenario. Applicant notes further that this element is presented in means plus function form, and thus the examiner must directly consider the structure disclosed in the specification which performs the pick-off function. There is no equivalency between "inherent leakage" and the structure disclosed. Finally, there is no spectral filter for narrowing the signal source spectrum in Richardson, nor is there a tap located beyond this narrowing element so that the narrowed spectrum can be measured.

Should the Examiner persist in the current rejection, Applicants would wish to have the Examiner address, point-by-point, where each of the claimed elements is identically disclosed in the reference.

Claim 9: Richardson fails to disclose or suggest a down-counter module comprised of an AOM which operates additionally as a bandwidth filter. The reference mentions AOMs in other contexts only.

Claim 13: Richardson does not disclose or suggest an oscillator that produces a relatively broad spectrum output above approximately the 10nm range as claimed, nor does it disclose or suggest an attenuator module which attenuates the oscillator output. Richardson appears to be silent on the spectrum of its oscillator, and therefore cannot be said to be anticipatory of the limitations currently claimed in claim 13.

Claim 15: Many of the arguments and points made with respect to claims 2 and 4 are equally applicable to claim 15, and will not be repeated here for sake of brevity. Claim 15 additionally claims the polarization fidelity improving means, located between modules. Regarding the Examiner's general assertions regarding "unwanted polarization", applicant notes that Richardson is silent regarding means for improving the fidelity of the system polarization state. Richardson discloses polarizing elements to select polarization within the laser source (oscillator) for mode-locking the laser. This is an entirely different concept; e.g., this intra-cavity polarization control is the mechanism for mode-locking Richardson's laser. There is no disclosure of polarization units between modules to prevent build up of side pulses at various points within the system. The modules recited in claim 15 are the oscillator, stretcher and amplifier modules

Moreover, if the examiner is suggesting the features are *inherent* the examiner must show that the structure necessarily follows from the disclosure of Richardson. Applicant submits the features are not inherent.

New **claim 38** follows on this limitation with more structural details, namely, the polarization element being there claimed as a module having a combination of an attenuator and a tap point. It is not seen where Richardson discloses anything of the kind.

Claim 16: Key to this claim is the limitation of an AOM unit combining the functions of pulse selection and bandwidth filter. The Examiner has not demonstrated that Richardson discloses an AOM for pulse selection, much less an AOM which further includes a bandwidth filter function.

Claim 23: This claim also contains the isolator element previously discussed in regard to claims 2 and 3, providing at least 35dB isolation between source and amplifier, and further specifies a spectral filter located within the isolator module, narrowing a spectrum of a signal output from said oscillator. Richardson discloses neither element as claimed, much less their unique combination.

Claim 24: The arguments related to spectral matching and polarization fidelity in conjunction with claims 2 and 15 apply as well here.

Claim 33: This claim is unique in reciting an AOM module operating as a pulse deflector, introducing spatial dispersion, combined with a bulk grating compressor which compensates for this spatial dispersion. Richardson discloses AOMs, but only for creating a timed "transmission window" for the pulses (see paragraph [195]). They do not act as pulse deflectors or create spatial dispersion. Similarly, the compressor of Richardson only compensates temporal dispersion, not spatial dispersion. Accordingly, Richardson does not speak to either of these key limitations in claim 33.

Claim 39: This new claim contains several of the elements previously discussed in connection with, e.g., claim 15. In addition, the claim is unique in requiring that the modules

comprise at least one of a polarization maintaining fiber amplifier and a length of an undoped polarization maintaining fiber. Richardson does not speak to polarization-maintaining fiber at all, much less to PM-PM splicing per **claim 40**. It is also noted that this claim recites the taps in "means plus function" form, requiring the Examiner to consider the actual tap structure taught in the specification and drawings as well as the manner in which they provide for connection to test equipment.

With respect to the forgoing highlighted elements of the claims, Applicants submit that the cited Richardson reference fails to qualify as an anticipatory teaching in that its disclosure cannot meet the required test: "*Anticipation requires every element of the claimed invention must be identically shown in a single reference... and must be arranged as in the claim under review*". Further, with respect to claims which recite features in "means plus function" form, the Examiner has made no effort to show where Richardson teaches such structure and function, *as would be required for anticipation of a means-plus-function claim.* Finally, to the extent that the Examiner is suggesting that certain features are *inherent,* the Examiner has failed to show that the claimed structure necessarily follows from the disclosure of Richardson.

When the disclosure of Richardson is properly assessed, Applicants believe that it will be apparent that the claims of the present application, and particularly those enumerated above, are clearly not anticipated by this reference.

COMMENTS ON THE RESPONSE TO APPLICANT'S' ARGUMENTS

The Examiner's written description and anticipation rejections are addressed in the paragraphs above. Various claims have been amended for clarity or added, to more particularly point out applicant's claimed invention.

As to the questions related to assembly and test and the requirements alignment, it appears there is a misunderstanding regarding the state of this technology prior to and after the present invention. The specification provides guidance regarding the problems faced by the inventors and the solutions. Applicant therefore points to at least the following portions of the specification for clarification:

> [0001] The present invention relates to an ultrafast pulse source for pulse energies in the submicrojoule to millijoule range. The present invention uses state-of-art technologies to build an all fiber based chirped pulse amplification laser system suitable for industrial applications.
>
> [0012] The following topics are covered in this application.
>
> [0013] 1) Functional segmentation of opto-mechanical components into modular devices to produce manufacturable industrial laser systems with Telcordia-grade quality and reliability.
>
> [0014] 2) Polarization fidelity within and between modules
>
> [0015] 3) Provision for tap units for test, monitoring or feedback
>
> [0016] 4) Spectral matching of oscillator to amplifier
>
> [0020] The invention thus relates to the technologies necessary to overcome the above problems and limitations of the prior art, to build a fiber-based chirped pulse amplification laser system suitable for industrial applications, in a modular and compact laser design with all modules replaceable. The modules are designed and manufactured to telecom standards and quality.
>
> [0021] Environmentally stable laser design is crucial for industrial application. An industrial laser system can be, for example, characterized by an output power variation below 0.5 dB over an environmental temperature range from 0 to 50 degrees Celsius, and by compliance with the vibration, thermal shock, high temperature storage and thermal cycling test criteria in Telcordia GR468-CORE and GR-1221-CORE. This target can be achieved by functional segmentation of the components and packaging the modular device with Telcordia-qualified packaging technology. Before the modules are assembled into a system, they are tested and assembled separately.

[0022] Included in the modules are tap units that allow taking out signals along the propagation path in an integrated design. This is necessary for the optimization of each module as it is assembled, and important in the spectral matching along the chain of modules

The paragraphs, as examples, explicitly point out the relevant needs and various problems solved with the present invention. Applicant therefore submits that the examiner's questions regarding assembly and test are fully addressed within the four-corners of the specification.

In view of the foregoing, Applicants solicit favorable reconsideration of the application and the currently active claims.

If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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